AAMA Sustainability White Paper

Understanding a Compliant Safety Data Sheet (SDS)

Vinyl is composed of abundant natural ingredients, including salt and natural gas.

By employing further chemistry, vinyl can be made flexible, rigid or semi-rigid; clear or colorful; thick or thin.

Part of the beauty of affordable, energy-efficient, versatile vinyl is that it can literally last a lifetime.

Vinyl is one of the most recycled materials worldwide. With long life cycles and natural fire resistance, it’s highly sustainable.

No wonder that vinyl is part of everyone’s daily lives. It is a major component of everyday products and relied on for residential and commercial construction.

Background - Chemical Reporting and the Globally Harmonized System (GHS)

Many countries in the world employ varying methods of hazard classification and communication systems. With the continuing growth of global commerce, more and more countries including the US, Canada, members of the EU, China, Australia, and Japan are aligning with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The GHS provides a baseline for the communication of globally agreed hazards classifications and communications systems.

This White Paper has been developed to provide the vinyl materials industry with a condensed and comprehensive overview of the new GHS requirements and the necessary information to understand GHS-compliant Safety Data Sheets.

The conversion to GHS provides a globally recognized and consistent approach to classifying chemicals and communicating hazard information on labels and safety data sheets.

Employer Requirements

Employers are required to provide their employees with information about chemical exposure via hazard communication programs, labels and other forms of warning, and safety data sheets. Information and training are components of these mandatory notifications.

Employers that do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers.

There will be no changes to the harmful physical and infectious agents requirements and the requirement for annual training and maintaining training records will remain.

Mandatory Compliance Dates

Chemical manufacturers, importers, distributors, and employers shall be in compliance with all modified provisions no later than June 1, 2015, with the following exceptions:
• **After June 1, 2015,** employers must comply with OSHA’s new Hazard Communication Standard; the annual training requirement under employee right-to-know and employee right-to-know requirements for harmful physical and infectious agents remains unchanged. The final OSHA enforcement policy is pending.

• **After December 1, 2015,** the distributor shall not ship containers labeled by the chemical manufacturer or importer unless the label has been modified to comply.

All employers shall, as necessary, update any alternative workplace labeling used under paragraph (f)(6) of this section, update the hazard communication program required by paragraph (h)(1), and provide any additional employee training in accordance with paragraph (h)(3) for newly identified physical or health hazards no later than June 1, 2016.

**Major HCS changes are in labeling and SDS format, formerly Material Safety Data Sheets (MSDS).**

**Hazard classification**

While similar to the previous hazard assessment requirement, the definition of hazard has been changed, and now there are specific criteria for classifying health and physical hazards. Compounded Mixtures must also be classified. In addition to classifying their hazards, they must be categorized by severity with a 1 representing the most severe hazard.

**NOTE:** *The hazardous nature of the material has not changed, the communication format has*

The SDS (Safety Data Sheet) includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. The information contained in the SDS must be in English (although it may be in other languages). In addition, OSHA requires that SDS preparers provide specific minimum information as detailed in Appendix D of 29 CFR 1910.1200. The SDS preparers may also include additional information in various section(s).

**Safety Data Sheets (SDS)**

SDSs must be constructed and laid out in a standard 16-section format similar to the American National Standards Institute (ANSI) standard for Hazardous Workplace Chemicals-Hazard Evaluation and Safety Data Sheets and Precautionary Labeling Preparation.

Information on a label will coincide with information on the corresponding safety data sheet. For example: the precautionary statements will be the same on the label as on the SDS. While labels provide important information for anyone who handles, uses, stores and transports hazardous chemicals, they are limited by design in the amount of information they can provide. SDS must accompany all hazardous chemicals, and are a more complete resource for hazardous chemicals details.

Sections 1 through 8 contain general information about the chemical; identification, hazards, composition, safe handling practices, and emergency control measures (e.g., fire fighting).

**SECTION 1: IDENTIFICATION**

This section identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier.

**The required information:**

- Product identifier used on the label and any other common names or synonyms by which the substance is known. Vinyl is also known as PVC, suspension polyvinyl chloride compound, and chloroethylene polymer

- Name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.
- Recommended use of the chemical (e.g., a brief description of its function, such as flame retardant) and any restrictions on use (including recommendations given by the supplier).

THE FACTS

Vinyl can be extruded into building products like siding, molding, decking, windows, fencing, doors and skylights. Vinyl is used for its toughness, durability, superior weathering properties and flame resistance.

SECTION 2: HAZARD(S) IDENTIFICATION

This section identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards.

The required information:
- The hazard classification of the chemical
- Signal word.
- Hazard statement(s).
- Pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or be a description of the name of the symbol (e.g., skull and crossbones, flame). This is one of the most significant areas of change in the new SDS sheets. The pictograms are simple and clear to understand.
- Precautionary statement(s).
- Description of hazards not otherwise classified.
- For a mixture that contains an ingredient(s) with unknown toxicity, a statement describing what percentage of the mixture consists of ingredient(s) with unknown acute toxicity.

Please note that this is a total percentage of the mixture and not tied to the individual ingredient(s).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

This section identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed.

The required information:

Substances
- Chemical name.
- Common name and synonyms.
- Chemical Abstracts Service (CAS) number and other unique identifiers.
- Impurities and stabilizing additives, which are classified separately and which contribute to the classification of the chemical.

Mixtures
- The chemical name and concentration (i.e., exact percentage) of all ingredients which are classified as health hazards and are:
  - Present above their cut off/concentration limits or
  - Present a health risk below the cut off/concentration limits.
- The concentration (exact percentages) of each ingredient must be specified except concentration ranges may be used in the following situations:
  - A trade secret claim is made,
  - There is batch-to-batch variation, or
  - The SDS is used for a group of substantially similar mixtures.
Chemicals where a trade secret is claimed
- A statement that the specific chemical/identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

SECTION 4: First-Aid Measures

This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical.

The required information
- Necessary first-aid instructions by relevant routes of exposure (inhaled, skin and eye contact, and ingestion).
- Description of the most important symptoms or effects, and any symptoms that are acute or delayed.
- Recommendations for immediate medical care and special treatment needed, when necessary.

THE FACTS

Standard first aid measures apply to vinyl. Skin contact with vinyl can usually be washed with mild soap and water. Eye contact requires copious flushing the eyes with water for 15 minutes and if ingested, dilute by drinking fresh water.

SECTION 5: Fire-Fighting Measures

This section provides recommendations for fighting a fire caused by the chemical.

The required information:
- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on specific hazards that develop from the chemical during the fire, such as combustion products created when the chemical burns.
- Recommendations on special protective equipment or precautions for firefighters.

THE FACTS

Vinyl is not flammable under normal conditions of use. Vinyl profiles will char if exposed to sustained external sources of high heat. In general, vinyl will not sustain combustion and will self-extinguish without exposure to heat from another source. Molten vinyl can sustain pyrolysis and ignite nearby flammable material.

Dry chemical, foam, water or carbon dioxide can be used as an extinguishing media.

Firefighters should wear proper protective equipment and self-contained breathing apparatus since the major of gaseous products of the combustion are carbon monoxide, carbon dioxide and hydrogen chloride.

SECTION 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, property, or the environment.

It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard.
The required information:

- Use of personal precautions (such as removal of ignition sources or providing sufficient ventilation) and protective equipment to prevent the contamination of skin, eyes, and clothing.
- Emergency procedures, including instructions for evacuations, consulting with experts when needed, and the appropriate protective clothing.
- Methods and materials used for containment (e.g., covering and capping drains procedures).
- Cleanup procedures (e.g., appropriate techniques for neutralization, decontamination, cleaning or vacuuming; adsorbent materials; and/or equipment required for containment/clean up).

THE FACTS

For dust created during profile fabrication standard spill response measures apply to vinyl materials. Use a HEPA filtered vacuum, or other dustless methods to gather up spilled material. Correct disposal by placement in a suitable container for subsequent disposal must be followed. Local disposal laws and regulations must be followed for container disposal. Avoid dust formation.

SECTION 7: Handling and Storage

As with any chemical, good industrial hygiene is key to the safe and responsible use of the material. This section provides guidance on the safe handling practices and conditions for safe storage of chemicals.

The required information:

- Precautions for safe handling, including recommendations for handling incompatible chemicals, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g., where eating, drinking, and smoking in work areas is prohibited).
- Recommendations on the conditions for safe storage, including any incompatibilities. Provide advice on specific storage requirements (e.g., ventilation requirements).

SECTION 8: Exposure Controls/Personal Protection

This section indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure.

The required information:

OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.

Appropriate engineering controls (e.g., use of local exhaust ventilation, or use only in an enclosed system).
- Recommendations for personal protective measures to prevent illness or injury from exposure to chemicals, such as personal protective equipment (PPE) (e.g., appropriate types of eye, face, skin or respiratory protection based on hazards and potential exposure).
- Any special requirements for PPE, protective clothing or respirators (e.g., glove material, such as PVC or nitrile rubber gloves; and breakthrough time of the glove material).

THE FACTS

Many materials can generate dust. Standard industrial hygiene practices apply when handling materials that create dust. Always use the recommended PPE and mechanical control methods. Exposure limits for particulate dust apply.
Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision.

The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

SECTION 9: Physical and Chemical Properties

This section identifies physical and chemical properties associated with the substance or mixture.

The minimum required information consists of:

- Appearance (physical state, color)
- Odor threshold
- pH
- Melting point/freezing point
- Initial boiling point and boiling range
- Flash point
- Evaporation rate
- Flammability (solid, gas)
- Upper/lower flammability or explosive limits
- Vapor pressure
- Relative density
- Solubility(ies)
- Partition coefficient: n-octanol/water
- Auto-ignition temperature
- Decomposition temperature
- Viscosity

The SDS may not contain every item on the above list because information may not be relevant or is not available. When this occurs, a notation to that effect must be made for that chemical property. Manufacturers may also add other relevant properties, such as the dust deflagration index (Kst) for combustible dust, used to evaluate a dust’s explosive potential.

THE FACTS

Vinyl compounds are solid materials either in powder or pellet form. They are free-flowing. Vinyl will soften gradually with increasing temperature and is insoluble in water.

SECTION 10: Stability and Reactivity

This section describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other.

The required information:

Reactivity
- Description of the specific test data for the chemical(s). This data can be for a class or family of the chemical if such data adequately represent the anticipated hazard of the chemical(s), where available.

Chemical stability
- Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions while in storage and being handled.
- Description of any stabilizers that may be needed to maintain chemical stability.
- Indication of any safety issues that may arise should the product change in physical appearance.

Other
- Indication of the possibility of hazardous reactions, including a statement whether the chemical will react or polymerize, which could release excess pressure or heat, or create other hazardous conditions. Also, a description of the conditions under which hazardous reactions may occur.
- List of all conditions that should be avoided (e.g., static discharge, shock, vibrations, or environmental conditions that may lead to hazardous conditions).
• List of all classes of incompatible materials (e.g., classes of chemicals or specific substances) with which the chemical could react to produce a hazardous situation.
• List of any known or anticipated hazardous decomposition products that could be produced because of use, storage, or heating. (Hazardous combustion products should also be included in Section 5 (Fire-Fighting Measures) of the SDS.)

**THE FACTS**

Vinyl profiles are stable under the recommended storage and handling conditions as prescribed. To avoid deflection of the profile, avoid temperatures above 68°C (154 °F), degradation will occur at elevated temperatures above 250°C (482 °F).

**SECTION 11: Toxicological Information**

This section identifies toxicological and health effects information or indicates that such data are not available.

*The required information:*

• Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). The SDS should indicate if the information is unknown.
• Description of the delayed, immediate, or chronic effects from short- and long-term exposure.
• The numerical measures of toxicity (e.g., acute toxicity estimates such as the LD50 median lethal dose - the estimated amount [of a substance] expected to kill 50% of test animals in a single dose.
• Description of the symptoms. This description includes the symptoms associated with exposure to the chemical including symptoms from the lowest to the most severe exposure.
• Indication of whether the chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions) or found to be a potential carcinogen by OSHA.

**THE FACTS**

Vinyl compounds used in building products typically contain Titanium Dioxide which is commonly used as a whitening agent in paint, charging cords, trash bags, food, drugs, toothpaste, and cosmetics.

The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.

**SECTION 12: Ecological Information (OSHA non-mandatory)**

This section provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment.

*The section may include:*

• Data from toxicity tests performed on aquatic and/or terrestrial organisms, where available (e.g., acute or chronic aquatic toxicity data for fish, algae, crustaceans, and other plants; toxicity data on birds, bees, plants).
• Whether there is a potential for the chemical to persist and degrade in the environment either through biodegradation or other processes, such as oxidation or hydrolysis.
• Results of tests of bioaccumulation potential, making reference to the octanol-water partition
• The potential for a substance to move from the soil to the groundwater (indicate results from adsorption studies or leaching studies).
• Other adverse effects (e.g., environmental fate, ozone layer depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and/or global warming potential).
THE FACTS

In the US, no lead is added to vinyl profiles that are assembled into AAMA Certified windows and doors.

This section provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices. To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS.

SECTION 13: Disposal Considerations (OSHA non-mandatory)

This section provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices. To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS.

The section may include:
- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities.

THE FACTS

As with any material, vinyl should be disposed of in accordance with all applicable federal, state, provincial and local regulations.

The information may include:
- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities.

SECTION 14: Transport Information (OSHA non-mandatory)

This section provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea.

The information may include:
- UN number (i.e., four-figure identification number of the substance).
- UN proper shipping name.
- Transport hazard class(es).
- Packing group number, if applicable, based on the degree of hazard.
- Environmental hazards (e.g., identify if it is a marine pollutant according to the International Maritime Dangerous Goods Code (IMDG Code)).
- Guidance on transport in bulk (according to Annex II of MARPOL 73/783 and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code (IBC Code)).
- Any special precautions which an employee should be aware of or needs to comply with, in connection with transport or conveyance either within or outside their premises (indicate when information is not available).
SECTION 15: Regulatory Information (OSHA non-mandatory)

This section identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS.

The information may include:
- Any national and/or regional regulatory information of the chemical or mixtures (including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations).

SECTION 16: Other Information

This section indicates when the SDS was prepared or when the last known revision was made.

- The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for the explanation of the changes. Other useful information may also be included here.

EMPLOYER RESPONSIBILITIES

The employer shall maintain in the workplace copies of the required safety data sheets for each hazardous chemical and shall ensure they are readily accessible during each workshift to employees when they are in their work area(s). (Electronic access and other alternatives to maintaining paper copies of the safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.) Furthermore, employers may want to designate a person(s) responsible for obtaining and maintaining the SDSs. If the employer does not have an SDS, the employer or designated person(s) should contact the manufacturer to obtain one.

Where employees must travel between workplaces during a workshift, for example their work is carried out at more than one geographical location, the safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure employees can immediately obtain the required information in an emergency.

Safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical and is readily accessible during each workshift to employees when they are in their work area(s).
GHS – COMPLIANT PICTOGRAMS

The pictograms OSHA has adopted improve worker safety and health, conform with the GHS and are used worldwide. While the GHS uses a total of nine pictograms, OSHA will only enforce the use of eight. The environmental pictogram is not mandatory but may be used to provide additional information.

OSHA’s required pictograms must be in the shape of a square at a point and include a black hazard (symbol on a white background with a red frame sufficiently wide enough to be clearly visible).

*Note: GHS does not include combustible-dust hazards of chemicals: there is no pictogram for this type of hazard.*

<table>
<thead>
<tr>
<th>OLD HMIS Compliant Pictograms</th>
<th>NEW GHS Compliant Pictogram</th>
<th>Pictogram Description</th>
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<tbody>
<tr>
<td>E Explosive</td>
<td>GHS 01 Explosive</td>
<td>Exploding Bomb</td>
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<tr>
<td></td>
<td>JPG</td>
<td>The exploding bomb pictogram symbolizes explosives, self-reactive substances and organic peroxides.</td>
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<tr>
<td>F+ Extremely Flammable</td>
<td>GHS 02 Flammable</td>
<td>Flame</td>
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<tr>
<td>F Highly Flammable</td>
<td>JPG</td>
<td>The flame pictogram symbolizes chemicals that are flammable, emit flammable gas, are self-reactive substances, are pyrophorics (spontaneously igniting in air), are self-heating and/or are organic peroxides.</td>
</tr>
<tr>
<td>O Oxidizing</td>
<td>GHS 03 Oxidizing</td>
<td>Flame over circle</td>
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<tr>
<td></td>
<td>JPG</td>
<td>The flame-over-circle pictogram indicates the chemical is an oxidizer.</td>
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<tr>
<td>No Symbol</td>
<td>GHS 04 Pressurized Gases</td>
<td>Gas cylinder</td>
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<tr>
<td></td>
<td>JPG</td>
<td>Gases under pressure, such as compressed gases, liquefied gases and dissolved gases.</td>
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<tr>
<td>C Corrosive</td>
<td>GHS 05 Corrosive</td>
<td>Corrosion</td>
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<td></td>
<td>JPG</td>
<td>The corrosion pictogram warns of chemicals that cause skin corrosion or burns, eye damage or are corrosive to metals.</td>
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<tr>
<td>T+ Very Toxic</td>
<td>GHS 06</td>
<td>Skull and crossbones</td>
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<td>T Toxic</td>
<td>JPG</td>
<td>The skull and crossbones pictogram symbolizes acute toxicity.</td>
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<tr>
<td>Symbol</td>
<td>Description</td>
<td>Pictogram</td>
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<td>N</td>
<td>Harmful to the Environment</td>
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</table>

**FIGURE 1**
The AAMA VMC members include manufacturers of windows, doors, skylights and related building products and their component and material suppliers.

Collectively, we advocate the development of voluntary technical standards, extrusion, profile certification, marketing, green and sustainable fenestration products and educational programs.

Additional Information about the AAMA Vinyl Material Council can be found at www.aamanet.org/vinyl.